Department of Computer Science and Information Technology

**Assignment-5**

**Design and Analysis of Algorithm**

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| **Q. No.** | **Questions** | **CO** | **Bloom’s level** |
|  | Insert the following element in an initially empty RB-Tree. 12, 9, 81, 76, 23, 43, 65, 88, 76, 32, 54. Now Delete 23 and 81. | CO2 | L3 |
|  | Discuss the advantages of using B-Tree. Insert the following Information 86, 23, 91, 4, 67, 18, 32, 54, 46, 96, 45 into an empty B-Tree with degree t = 2 and delete 18, 23 from it. | CO2 | L4 |
|  | Explain properties of Binomial Heap. Write an algorithm to perform uniting two Binomial Heaps. And also to find Minimum Key. | CO2 | L4 |
|  | Solve the following 0/1 knapsack problem using dynamic programming. P=[11,21,31,33] w=[2,11,22,15] c=40, n=4. | CO4 | L4 |
|  | Define Floyd Warshall Algorithm for all pair shortest path and apply the same on following graph: | CO4 | L4 |
|  | Find an optimal parenthesization of a matrix chain product whose sequence of dimensions is {10, 5, 3, 12, 6}. | CO4 | L4 |
|  | Solve the Subset sum problem using Backtracking, where  n=4, m=18, w[4] = {5, 10, 8, 13} | CO4 | L4 |
|  | Define NP-Hard and NP- complete problems. What are the steps involved in proving a problem NP-complete? Specify the problems already proved to be NP-complete. | CO5 | L3 |
|  | Apply the greedy single source shortest path algorithm on the following graph: | CO3 | L4 |
|  | What is Minimum Cost Spanning Tree? Explain Kruskal’s Algorithm and Find MST of the Graph. Also write its Time-Complexity. | CO3 | L4 |